REMARKS

This Response is offered in reply to Office Action mailed December 17, 2002.

Applicants have amended claim 10 to correct an incorrect numbering thereof in the previously-filed Response To Office Action. Favorable action is requested.

In paragraph 2 of the action, claims 10-24 are rejected under 35 USC 103(a) in view of the WO '973 document taken with the Nazmy '442 patent.

This rejection is believed to be in error. The examiner acknowledges that the WO '973 document does not teach the use of a titanium aluminide alloy including a rare earth element in an amount effective to prolong resistance to attack of the alloy by molten material comprising aluminum.

Applicants agree and note that nowhere in the WO '973 document is there any disclosure or suggestion of a method of increasing the service life of a titanium aluminide alloy in contact with a molten material comprising aluminum by including in the titanium aluminide alloy a rare earth element in an effective amount to prolong resistance to attack of the alloy by the molten material.

The examiner cites the Nazmy '442 patent as disclosing a gamma Ti-Al alloy intended for machine components and as allegedly teaching that certain alloying additions, such as Y, provide excellent hardness and strength at high temperatures. The examiner refers to exemplary embodiments 54 and 56 of the '442 patent as illustrating that the field of application of the modified Ti-Al alloys can be extended to temperatures between 600 to 1000 degrees C.

However, the examiner ignores that only an improvement in hardness and strength is described in the '442 patent and is achieved in hardness and tensile testing that presumably is conducted in ambient air (the patent fails to describe the testing atmosphere). The examiner will appreciate that determination of mechanical properties, such as hardness and tensile strength, in

air in the '442 patent teach absolutely nothing about the resistance of alloys to attack by contact with a molten material comprising aluminum.

Applicants disagree with the combination of the '442 patent with the WO '973 document to reject Applicants' claims 10-15 and 18-24. For example, as pointed out above, the WO '973 document makes no disclosure or suggestion to include a rare earth element for any purpose. The '442 patent discloses only an improvement in hardness and strength achieved in testing that presumably is conducted in ambient air by inclusion of numerous alloying elements. The '442 patent nowhere discloses contacting a Ti-Al alloy with molten material comprising aluminum and nowhere discloses or suggests a method of increasing service life of an alloy in contact with such molten material. The examiner will appreciate that mechanical properties determined in air in the '442 patent teach absolutely nothing about the resistance of alloys to attack by contact with molten material comprising aluminum.

The examiner cannot use mechanical property test data determined for titanium aluminide alloys in air to extrapolate or predict the effect of an alloying element, such as a rare earth element, on resistance of the alloy to attack by molten material comprising aluminum. To do so would amount to mere speculation on the examiner's part. Applicants ask the examiner to cite any teaching in the '442 patent that would lead one skilled in the art to arrive at Applicants' claimed method for increasing the service life of a titanium aluminide alloy in contact with a molten material comprising aluminum.

The examiner's argument that it would have been obvious to add a rare earth element, such as Y, to the Ti-Al alloy of WO '973 misses the point that Applicants' claims are directed to a method of increasing the service life of the titanium aluminide

alloy in contact with molten material comprising aluminum. The rejection ignores that neither the WO'973 document nor the '442 patent suggests including any alloying element to this end. That the '442 patent discloses adding a rare earth element to a Ti-Al alloy improves hardness and strength at high temperature in air teaches nothing with respect to Applicants' claims.

The examiner can arrive at Applicants' method claims 10-15 and 18-24 only through a prohibited hindsight analysis after having knowledge of the claimed invention. The examiner admits that the WO '973 document is silent to this end. The examiner should appreciate that the '442 patent's disclosing to add Y or other element to a Ti-Al alloy to improve hardness and strength at high temperature in air teaches nothing with respect to Applicants' method claims directed to increasing the service life of the titanium aluminide alloy by prolonging resistance to attack by molten material comprising aluminum and its alloys. The hindsight nature of the rejection is evident in the examiner's choosing only Y as the alloying element from the WO '973 document out of the numerous alloying elements listed in the '442 patent. For example, the '442 patent lists Co, Cr, Ge, Hf, Mn, Mo, Nb, Pd, Ta, V, W, Y, and/or Zr as alloying elements to improve hardness and strength in air testing. The examiner picks only the Y alloying element from among those listed to reject claims 12 and 21-24 without any teaching in the '442 patent that Y or any of the other numerous alloying elements listed would have an effect of any kind on the alloy with respect to attack by a molten material comprising aluminum.

Neither cited reference discloses or renders obvious Applicants' claims 10-15 and 18-24.

Applicants refer the examiner to page 4 of the specification where the resistance of different specimens to attack by molten aluminum at 700 degrees C is described and shown in the TABLE. The TABLE reveals that resistance to attack was increased by more than 2 times for the titanium aluminide alloy including 1.5 weight % Y pursuant to the invention as compared to the titanium alloy without Y (i.e. 0 weight % Y) representative of WO '973. The TABLE also reveals that resistance to attack was increased by more than 4 times for the titanium aluminide alloy including 5.0 weight % Y pursuant to the invention as compared to the titanium alloy without Y (i.e. 0 weight % Y) representative of the WO '973 document.

Neither the WO '973 document nor the '442 patent provides any disclosure or suggestion whatsoever that resistance to such attack can be so dramatically prolonged by including a rare earth element in a titanium aluminide alloy. Applicants' ask the examiner to identify where in either cited reference is such an improvement even remotely suggested?

With respect to claims 16-20, pending claim 16 recites a method of prolonging resistance of a titanium aluminide alloy to molten material comprising aluminum using a combination of purposeful steps that are not suggested in the WO '973 document or inherent in operation of the die casting machine as apparently suggested by the examiner. The '442 patent is utterly silent with respect to steps set forth in claims 16-20 as the examiner will appreciate. Claims 18, 19, and 20 additionally are not suggested by either cited reference for the reasons stated above.

Reconsideration of the rejection of claims 10-24 is requested.

In paragraph 4 of the office action, claims 10-15 and 21-24 are rejected under the judicially created doctrine of obviousness type double patenting in view of claims 1-14 of US Patent 6 238 195 in view of the '442 patent.

The examiner acknowledges that the '195 patent does not teach the use of a titanium aluminide alloy including a rare earth element in an amount effective to prolong resistance to attack of the alloy by molten material comprising aluminum.

The examiner's citation of the '442 patent to make up for this gross deficiency of the '195 patent is in error for the reasons set forth above. The '442 patent discloses only an improvement in hardness and strength achieved in ambient air testing. The '442 patent nowhere discloses contacting a Ti-Al alloy with molten material comprising aluminum and nowhere discloses or suggests a method of increasing service life of an alloy in contact with such molten material. The examiner should appreciate that mechanical properties in ambient air in the '442 patent teach absolutely nothing about the resistance of alloys to attack by contact with a molten material comprising aluminum. The examiner cannot use mechanical property test data determined for titanium aluminide alloys in air to extrapolate or predict the effect of an alloying element, such as a rare earth element, on resistance of the alloy to attack by such molten material. To do so would amount to mere speculation on the examiner's part.

Applicants again refer to the Table on page 4 of their specification and its showing of a dramatic prolongation of the resistance of the tested titanium aluminide alloys to attack by molten aluminum. Such dramatic prolongation of resistance to attack is not disclosed or remotely suggested by either the '195 patent or the '442 patent. Applicants' again ask the examiner to identify where in either cited reference is such an improvement even remotely suggested?

Entry of this amendment and allowance of pending claims 10-24 is requested.

Respectfully submitted,

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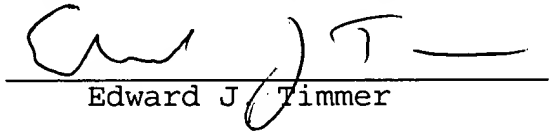
CERTIFICATE OF MAILING

I hereby certify that this correspondence and enclosures are being deposited with the United States Postal Service under 37 CFR 1.8 as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on February 18, 2003.



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